Remarks:

Information Disclosure Statement:

Applicant notes that the Office Action does not provide acknowledgement of receipt of references cited by Applicant in Information Disclosure Statements that were previously filed in the application. Applicant notes that two Information Disclosure Statements were filed in the application; one filed January 29, 2002, and another filed December 16, 2002. Copies of the return postcards are shown in Exhibit A. Applicant is unsure whether the two statements were ever associated with the application file in the Office.

Notwithstanding, Applicant has enclosed herewith an Information Disclosure Statement that lists the references filed in the earlier filed Statements together with the requisite fee under 1.17(p). It is requested that the listed references be included in the "References Cited" portion of any patent issuing from this application.

In the Specification:

Please amend the title at page 2, lines 2-3 of the specification as indicated.

Claims

Claim 21 has been amended to more particularly and distinctly define the invention. No new matter is added. Claims 22-24 have been cancelled without prejudice.

Claim Rejections - 35 U.S.C. §102(e)

A. Claims 1-3 and 13-21 stand rejected under 35 U.S.C. §102(e) for allegedly being anticipated by Hirota et al. (United States Patent No. 6,367,246). In particular the Examiner asserts:

> Regarding claims 1-3, Hirota discloses a diesel engine exhaust system comprising: a soot filter (18); and low temperature NO2 trap material comprising zeolites selected from the group consisting of acidic zeolites and base metal-exchanged zeolites, and wherein the low temperature NO2 trap material is deposited on a carrier upstream and in train with the soot filter (See col. 3, lines 32-67; col. 4, lines 1-14).
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> Regarding claim 4, Hirota further discloses that the zeolites are selected from the group consisting of ZSM-5, ETS-10, y zeolite, Beta zeolite,

ferrierite, mordenite, titanium silicates and aluminum phosphates (See col. 11, lines 5-47).

Regarding claim 5, Hirota further discloses that the base metals are selected from the group consisting of Mn, Cu, Fe, Co, W, Re, Sn, Ag, Zn, Mg, Li, Na, K, Cs, Nd, Pr and combinations thereof (See col. 11, lines 5-47).

Regarding claim 13, Hirota further discloses that the soot filter comprises a ceramic monolithic structure having an upstream axial end and a downstream axial end, the structure having parallel flow channels with macroporous walls, wherein the channels having an opening at the upstream axial end are closed at the downstream axial end, and the channels having an opening at the downstream axial end are closed at the upstream axial end, thereby defining upstream and downstream sides of the channel walls (See col. 3, lines 32-67; col. 4, lines 1-14).

Regarding claim 14, Hirota further discloses a catalyst composition is deposited on the downstream channel walls of the soot filter (See col. 3, lines 32-67; col. 4, lines 1-14).

Regarding claim 15, Hirota further discloses that the catalyst composition, deposited on the downstream channel walls of the soot filter, comprises a lean NOx catalyst composition (See col. 3, lines 32-67; col. 4, lines 1-14).

Regarding claim 16, Hirota further discloses that the catalyst composition, deposited on the downstream channel walls of the soot filter, comprises a catalyst composition effective for the combustion of unburned hydrocarbons and carbon monoxide (See col. 3, lines 32-67; col. 4, lines 1-14).

Regarding claims 17-18, and 21, Hirota discloses that the method of treating a diesel exhaust stream containing NO2 and unburned hydrocarbons, comprising: passing the exhaust stream through a diesel engine exhaust system comprising a soot filter (18) and low temperature NO2 trap material deposited on a carrier upstream of the soot filter; adsorbing at least some of the NO2 onto the low temperature NO2 trap material and at least some of the unburned hydrocarbons onto the low temperature NO2 trap material; heating the NO2 trap material to desorb at least some of the adsorbed NO2 and some of the unburned hydrocarbons from the low temperature NO2 trap material; and oxidizing at least some of the unburned hydrocarbons with the desorbed NO2 (See col. 5, lines 52-67; col. 6, lines 1-67; col. 7, lines 1-8).

Regarding claim 19, Hirota further discloses that the low temperature NO2 trap material discloses zeolites selected from the group consisting

of acidic zeolites and base-metal exchanged zeolites (See col. 3, lines 32-67; col. 4, lines 1-14).

Applicant respectfully disagrees. Applicant's invention is directed to a diesel exhaust system wherein the low temperature NO_2 trap material is deposited on a carrier upstream and in train with the soot filter. In this configuration, NO_2 (that has been absorbed at lower exhaust temperatures) can be released at higher exhaust temperatures, can pass downstream, and can be effectively utilized to combust the soot trapped on the soot filter.

Regarding claims 1-5, 13-16, Hirota et al. fails to disclose a low temperature NO_2 trap material deposited on a carrier upstream and in train with the soot filter. Figure 2 in Hirota et al. discloses the NOx adsorbent on the soot filter itself, and not on a carrier upstream of the soot filter. In fact, Hirota et al. asserts that having a NOx storing member upstream of the site of where particulates are collected is undesirable because the particulates are disclosed to poison the NOx storing member (see, for example, the discussion at column 1, lines 23-28 and at column 5, lines 18-25).

Regarding claims 17-20, Hirota et al. fails to disclose a method that utilizes a diesel engine exhaust system that has a low temperature NO_2 trap material deposited on a carrier upstream and in train with the soot filter. Applicant has reviewed the specific portion of Hirota et al. that the Examiner asserts anticipates Applicant's invention (col. 5, lines 52-67; col. 6, lines 1-67; col. 7, lines 1-8), and failed to find a disclosure of Applicant's method. Here again, the NOx adsorbent in Hirota is deposited on the soot filter itself, and not on a carrier upstream of the soot filter.

As such, Hirota et al. cannot anticipate Applicant's invention. Accordingly, reconsideration of the rejection is respectfully requested.

Regarding claim 21, Applicant has amended the claim to more particularly and distinctly define the subject matter of his invention. The amendment obviates the rejection over Hirota et al. Reconsideration and withdrawal of the rejection is respectfully requested.

B. Deeba et al. United States Patent No. 6,098,378 ("the '378 patent")

Regarding claims 1-3, 17-18, and 20-21, Deeba discloses a diesel engine exhaust system comprising: a soot filter (Figs. 1-5); and low temperature NO2 trap material comprising zeolites selected from the group consisting of acidic zeolites and base metal-exchanged zeolites, and wherein the low temperature NO2 trap material is deposited on a carrier upstream and in train with the soot filter (See col. 9, lines 35-67; col. 10, lines 1-67; col. 11, lines 1-15).

Regarding claims 4 and 19, Deeba further discloses that the zeolites are selected from the group consisting of ZSM-5, ETS-I0, y zeolite, Beta zeolite, ferrierite, mordenite, titanium silicates, and aluminum phosphates (See col. 12, lines 1-67; col. 13, lines 1-18).

Regarding claims 5 and 22-24, Deeba further discloses that the base metals are selected from the group consisting of Mn, Cu, Fe, Co, W, Re, Sn, Ag, Zn, Mg, Li, Na, K, Cs, Nd, Pr and combinations thereof (See col. 9, lines 35-67; col. 10, lines 1-67; col. 11, lines 1-15).

Regarding claim 6, Deeba further discloses that the zeolites comprise a trivalent metal which in combination with Si forms an oxidic skeleton (See col. 10, lines 5-67; col. 11, lines 1-45).

Regarding claim 7, Deeba further discloses that the trivalent metal comprises at least one metal selected from the group consisting of Al, B, Ga, In, Fe, Cr, V, As and Sb (See col. 10, lines 5-67; col. 11, lines 1-45).

Regarding claim 8, Deeba further discloses that the zeolites comprise three-dimensional alumina-silicate zeolites characterized by pore openings whose smallest cross-section dimensions are at least 5 Angstroms and having a silicon to alumina ratio of at least 5 (See col. 10, lines 5-67; col. 11, lines 1-45).

Regarding claim 9, Deeba further discloses that the zeolites comprise titanium silicates (See col. 12, lines 10-67; col. 13, lines 1-32).

Applicant respectfully disagrees with the rejection regarding claims 1-9 and 17-19. Applicant's invention is directed to a diesel exhaust system wherein the low temperature NO_2 trap material is deposited on a carrier upstream and in train with the soot filter. In this configuration, NO_2 (that has been absorbed at lower exhaust temperatures) can be released at higher exhaust temperatures, can pass downstream, and can be effectively utilized to combust the soot trapped on the soot filter.

The '378 patent fails to disclose a configuration having low temperature NOx trap material deposited on a carrier upstream and in train with a soot filter. Applicant reviewed the portion of the patent cited by the Examiner in the Office Action (col. 9, lines 35-67; col. 10, lines 1-67; col. 11, lines 1-15), and indeed, the entire specification, but was unable to find any disclosure of such a configuration. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

Regarding claims 22-24, without conceding the validity of the rejection, Applicant has cancelled claims 22-24. Reconsideration of the rejection is respectfully requested.

C. Maaseidvaag et al.

Regarding claims 1-3, Maaseidvaag discloses a diesel engine exhaust system comprising: a soot filter (22); and low temperature NO2 trap material comprising zeolites selected from the group consisting of acidic zeolites and base metal-exchanged zeolites, and wherein the low temperature NO2 trap material is deposited on a carrier upstream and in train with the soot filter (See Fig. 4; col. 6, lines 10-56).

Regarding claim 10, Maaseidvaag further discloses that the a diesel oxidation catalyst (16) upstream of the soot filter (22) (See Fig. 1).

Regarding claim 11, Maaseidvaag further discloses that the NO2 trap material is deposited on a carrier that is interposed and in train with the diesel oxidation catalyst and the soot filter (See Fig. 4; col. 6, lines 10-56).

Regarding claim 12, Maaseidvaag further discloses that the comprising a canister, wherein the canister houses both the low temperature NO2 trap material and the soot filter (See Fig. 4; col. 6, lines 10-56).

Regarding claim 13, Maaseidvaag further discloses that the soot filter comprises a ceramic monolithic structure having an upstream axial end and a downstream axial end, the structure having parallel flow channels with macroporous walls, wherein the channels having an opening at the upstream axial end are closed at the downstream axial end, and the channels having an opening at the downstream axial end are closed at the upstream axial end, thereby defining upstream and downstream sides of the channel walls (See Fig. 4; col. 6, lines 10-56).

Regarding claim 14, Maaseidvaag further discloses a catalyst composition is deposited on the downstream side of the channel walls of the soot filter (See Fig. 4; col. 6, lines 10-56).

> Regarding claim 15, Maaseidvaag further discloses that the catalyst composition, deposited on the downstream side of the channel walls of the soot filter, comprises a lean NOx catalyst composition (See Fig. 4; col. 2, lines 26-67; col. 3, lines 1-50, col. 6, lines 10-56).
>
> Regarding claim 16, Maaseidvaag further discloses that the catalyst composition, deposited on the downstream side of the channel walls of the soot filter, comprises a catalyst composition effective for the combustion of unburned hydrocarbons and carbon monoxide (See Fig. 4; col. 6, lines 10-56).

Applicant respectfully disagrees with the rejection. Applicant's invention is directed to a diesel exhaust system wherein the low temperature NO_2 trap material is deposited on a carrier upstream and in train with the soot filter. In this configuration, NO_2 (that has been absorbed at lower exhaust temperatures) can be released at higher exhaust temperatures, can pass downstream, and can be effectively utilized to combust the soot trapped on the soot filter.

Maaseidvaag et al. fails to disclose a configuration having a low temperature NO_2 trap material deposited on a carrier upstream and in train with the soot filter. In particular, the Examiner asserts that the depiction of the system in Figure 4 and the accompanying discussion in Maaseidvaag et al. anticipates Applicant's invention. However, inspection of Figure 4 reveals that the NOx absorbent washcoat is deposited on the soot filter, and not on a separate carrier upstream of the soot filter. In fact, the NOx absorbent washcoat in Maaseidvaag is deposited on the second channels of the soot filter which are blocked at the inlet end. In this configuration, NOx desorbed from the NOx absorbent is unlikely to be able to combust the soot which is deposited on the surface of the first channels. As such, Maaseidvaag cannot anticipate Applicant's claimed invention. Reconsideration and withdrawal of the rejection is respectfully requested.

FEE DEFICIENCY

☒ If an extension of time is deemed required for consideration of this paper, please consider this paper to comprise a petition for such an extension of time; The Commissioner is hereby authorized to charge the fee for any such extension to Deposit Account No. 04-0480.

and/or

☒ If any additional fee is required for consideration of this paper, please charge Account No. 04-0480.

Closing Remarks

Applicants thank the Examiner for the Office Action and believe this response to be a full and complete response to such Office Action. Accordingly, favorable reconsideration in view of this response and allowance of the pending claims are earnestly solicited.

Respectfully submitted,

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